USB 3.0 ENGINEERING CHANGE NOTICE
(Reset Propagation)

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Title: USB3.0 Reset Propagation through Hubs
Applied to: USB3.0 (11132008)-final

Brief description of the functional changes proposed:
The ECR proposes to change the way resets are propagated by a hub. Currently resets are not propagated and if a host/hub is reset then software would be required to reset each individual downstream port. This change is required for two reasons: 1. When the host/hub is reset, the LTSSM state machines on the downstream port and any device connected to it will most probably get out of synch. A reset (hot/warm) will be required to get the LTSSM state machines back in synch   2. This will reduce the time required to enumerate devices on a topology as software will not be required to reset each individual downstream port.

Benefits as a result of the proposed changes:
Benefits described in the brief description of the functional changes proposed above.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
No USB3 system exists yet and implementations of the USB3 host/hubs are still in prototype stages.

An analysis of the hardware implications:
Hosts/hubs will be required to propagate reset

An analysis of the software implications:
Software will need to check the status of the downstream ports to ensure that the reset on the downstream port is completed before performing any other actions on that port.

An analysis of the compliance testing implications:
The compliance tests for hosts/hubs are still under development and will be written to test that hosts/hubs propagate reset signaling.

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Actual Change Requested

(a). Figure 10-9 needs to be modified as specified in the attachment U-148-ResetPropagation.pdf

(b). From Text (and location): Section 10.3.1.2, Page 10-14

This is the default state when local power is valid (self-powered) or VBUS becomes valid (bus-powered. A port transitions to this state in any of the following situations:

- From the DSPORT.Powered-off state when the hub receives a SetPortFeature(PORT_POWER) request.
- From any state except the DSPORT.Powered-off state when the port detects a disconnect.
- From the DSPORT.Powered-off state when the hub upstream port's link transitions from Rx.Detect to the polling state.
- From the DSPORT.Resetting state when a reset times out from Rx.Detect.Active.
- From the DSPORT.Disabled state when a SetPortFeature(PORT_LINK_STATE) Rx.Detext request is received for the port.

In this state the port's link shall be in the Rx.Detect state.

Note: The port's link shall still perform connection detection normally from the Rx.Detect if the hub upstream port's link is in U3.

To Text (and location): Section 10.3.1.2, Page 10-14

This is the default state when local power is valid (self-powered) or VBUS becomes valid (bus-powered. A port transitions to this state in any of the following situations:

- From the DSPORT.Powered-off state when the hub receives a SetPortFeature(PORT_POWER) request.
- From any state except the DSPORT.Powered-off state when the port detects a disconnect.
- From the DSPORT.Powered-off state when the hub upstream port's link transitions from Rx.Detect to the polling state.
- From the DSPORT.Resetting state when a reset times out from Rx.Detect.Active.
- From the DSPORT.Disabled state when a SetPortFeature(PORT_LINK_STATE) Rx.Detext request is received for the port.
- From the DSPORT.Powered-off state or DSPORT.Disabled state when the hub's upstream port is reset.
  Note: The hub shall issue a Warm Reset on the downstream port after it has transitioned the port to the DSPORT.RxDetect state and detected a far-end receiver, even if the upstream port reset is a hot reset.

In this state the port's link shall be in the Rx.Detect state.

Note: The port's link shall still perform connection detection normally from the Rx.Detect if the hub upstream port's link is in U3.

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(c). From Text (and location): Section 10.3.1.6, Page 10-15

A downstream port shall transition to the DSPORT.Resetting state when it receives a SetPortFeature(PORT_RESET) or SetPortFeature(BH_PORT_RESET) request unless the port is in the DSPORT.Powered-off or DSPORT.Disconnected state. If the downstream port is in the DSPORT.Powered-off or DSPORT.Disconnected state and receives a SetPortFeature reset request, the request is ignored. If the port state is DSPORT.Error when the SetPortFeature(PORT_RESET) request or SetPortFeature(BH_PORT_RESET) is received, the port shall send a warm reset on the downstream port link within tDSPortResetToLFPS. If the port state is DSPORT.Enabled and the port's link is in any state other than U3 when a SetPortFeature(PORT_RESET) request is received, the port shall initiate a hot reset on the link within tDSPortResetToHotReset. If the port receives a SetPortFeature(BH_PORT_RESET) request, the port shall initiate a warm reset on the link within tDSPortResetToHotReset.

Note: If the port initiates a hot reset on the link and the hot reset TS1/TS2 handshake fails a warm reset is automatically tried. Refer to the Link Chapter for details on this process. The port stays in the DSPORT.Resetting state throughout this process until the warm reset completes.

When the downstream port link enters Rx.Detect.Active during a warm reset, the hub shall start a timer to count the time it is in Rx.Detect.Active. If this timer exceeds tTimeForResetError while the link remains in Rx.Detect.active, the port shall transition to the DSPORT.Disconnected state.

To Text (and location): Section 10.3.1.5, Page 10-15

A downstream port transitions to the DSPORT.Resetting state in any of the following situations:

- From the DSPORT.Error state when a SetPortFeature(PORT_RESET) request or SetPortFeature(BH_PORT_RESET) is received, the port shall send a warm reset on the downstream port link.
- From the DSPORT.Enabled state and the port's link is in any state when a SetPortFeature(BH_PORT_RESET) is received. In this situation the port shall initiate a Warm Reset on the downstream port link.
- From any state except for DSPORT.Powered-off or DSPORT.Disabled orDSPORT.Disconnected if the hub detects a Reset on its Upstream Port. In this situation the port shall initiate a Hot/Warm Reset on the downstream port link depending on the type of Reset detected on the hub's upstream port and depending on the current state of the downstream port.
- From any state except for DSPORT.Powered-off or DSPORT.Disconnected when it receives a SetPortFeature(PORT_RESET) or SetPortFeature(BH_PORT_RESET). If the downstream port is in the DSPORT.Powered-off or DSPORT.Disconnected state and it receives one of the above requests, the request is ignored.
- From the DSPORT.Enabled state and the port's link state is in any state other than U3 when a SetPortFeature(PORT_RESET) is received. In this situation the port shall initiate a Hot Reset on the downstream port link.
- From the DSPORT.Enabled state and the port's link state is in U3 when a SetPortFeature(PORT_RESET) is received. In this situation the port shall initiate a Warm Reset on the downstream port link.

Note: If the port initiates a hot reset on the link and the hot reset fails during the link Recovery state, a warm reset will be automatically tried. Refer to the Link Chapter for details on this process. The port stays in the DSPORT.Resetting state throughout this process until the warm reset completes.When the downstream port link enters Rx.Detect.Active during a warm reset, the hub shall start a timer to count the time it is in Rx.Detect.Active. If this timer exceeds tTimeForResetError while the link remains in Rx.Detect.active, the port shall transition to the DSPORT.Disconnected state.